



Persian Gulf Review

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Information for Veterans Who Served in Desert Shield/Storm

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DoD Expands Outreach Efforts; Seeks Help from Gulf War Veterans

On October 22, 1996, Deputy Secretary of Defense John P. White announced a series of actions to reach out to and seek the help of about 20,000 Gulf War veterans who may have been near Khamisiyah, Iraq, during the period March 4-15, 1991. These actions are being undertaken as part of the ongoing efforts, at the direction of President Clinton and Secretary of Defense Perry, to conduct a full investigation of any information that could help determine the causes of Persian Gulf War veterans illnesses.

Shortly after the Gulf War ended, U.S. troops destroyed large quantities of Iraqi ammunition at Khamisiyah, a sprawling ammunition storage site in southern Iraq. Evidence that chemical weapons may have been among the munitions destroyed in March 1991 has triggered an intensified effort in DoD to reconstruct the events at that time.

Referring to the ongoing extensive investigation, Deputy Secretary White declared, "The story of Khamisiyah is still incomplete. We are putting the puzzle together, and we want those who were there to help us fill in the missing pieces. Khamisiyah is a watershed event in our search for information and understanding of Gulf War illnesses. It is the first event where we can place American troops in an area where we believe chemical weapons were destroyed.

"To our knowledge, service members at that time did not report the symptoms associated with exposure to chemical agents," continued Deputy Secretary White, "but our search for information continues. The possibility that some individuals could have been exposed at low levels has caused us to review our clinical investigative protocols. We want to reassure our veterans that no effort will be spared in understanding Gulf War veterans' illnesses, and no Gulf War veterans will be without the health care they need."

In August 1996, DoD began contacting 1,168 U.S. service members assigned to units involved in the March 4, 1991, demolition operations at the Khamisiyah bunker complex. The veterans were asked to call the DoD Persian Gulf Veterans hotline to report any medical problems they may be experiencing and provide any information they believe pertinent to this service incident. The national toll-free "incidents" hotline is 1-800472-6719. DoD officials indicated that they have been able to contact more than 500 of these individuals by telephone. DoD will send certified letters to those not reached by phone. *(Continued on Pg. 4)*

VA Under Secretary for Health Kenneth W. Kizer, M.D., M.P.H., on Persian Gulf War Veterans and Chemical Weapons

I understand and share the concerns of Persian Gulf War veterans and their families who are worried about the health consequences of military service in Operations Desert Shield and Desert Storm. VA has always remained open to the possibility that military personnel may have been exposed to a wide array of potentially hazardous agents, including chemical warfare agents, while serving in the Persian Gulf.



Dr. Kenneth W. Kizer

Since returning from the Persian Gulf War, some veterans have told us that they were exposed to chemical weapons. We carefully listened to these veterans and designed programs to effectively respond to their needs. VA programs include scientific research, medical care, disability compensation, and outreach efforts. Now that it seems probable that many, perhaps tens of thousands of U.S. troops had low-level exposure to chemical warfare nerve agents, we are intensifying our efforts on their behalf.

Scientific Research

We believe VA has an obligation to respond to the health-related questions and concerns raised by Persian Gulf War veterans. To draw definitive conclusions about the health of Persian Gulf War veterans, a carefully designed and well-executed research program is necessary. VA has initiated such a program. And in this regard, I am pleased to report that \$2.5 million has just been allocated to three new peer-reviewed, basic science research projects in this area. Additional resources have been identified for future studies. In fact, more than 30 individual research projects concerning Persian Gulf War veterans' illnesses are already being carried out by VA and university-affiliated investigators across the



nation. VA is also closely monitoring other Federal research efforts.

While these efforts represent a good beginning, I have directed the VA's Research and Development Service to take a completely fresh and broad look at these issues in light of the new information provided by DoD regarding chemical weapons. We are developing a strategic plan for an environmental health research agenda that specifically focuses on low-level exposures to neurotoxins that might result from military chemical warfare exposure or other situations. Also, we are organizing an international scientific symposium that bridges potential military and civilian incidents involving exposure to those types of chemicals. While research is very important, some veterans are suffering serious health problems and require medical attention now. Here is what we are doing in this area.

Medical Care

VA provides Persian Gulf Registry health examinations, referral center examinations, and readjustment and sexual trauma counseling, as well as outpatient and inpatient care under special eligibility provisions for Persian Gulf War veterans.

VA welcomes and strongly encourages the participation of all Persian Gulf War veterans in the Registry program. More than 60,000 Persian Gulf War veterans have already completed VA's Registry examination offered at all VA medical centers. About 187,000 Gulf War veterans have been seen in VA outpatient clinics, and more than 18,200 Gulf War veterans have received inpatient care at VA medical facilities.

Veterans who have participated in the Registry examination program have reported a diverse array of symptoms. The most commonly reported symptoms are fatigue, headache, muscle and joint pain, memory problems, shortness of breath, sleep disturbances, nausea, diarrhea and other gastrointestinal complaints, rashes, and chest pain. About 12 percent of the Registry participants have no health complaints.

Long before the June 21, 1996 DoD announcement concerning exposure to chemical agents, VA designed its clinical uniform case assessment protocol which includes tests to detect clinical signs and symptoms related to possible neurotoxic exposures. Neurologic examinations and cognitive testing have long been part of the examination protocol. As a result, VA diagnostic protocols and treatment programs did not require any significant revision in light of the recent DoD disclosures.

Similarly, several years ago, VA officials established a pilot medical assessment program at the VA Medical Center, Birmingham, Alabama, to evaluate the health status of Persian Gulf veterans in a Reserve Construction Battalion unit from Alabama, Tennessee, North Carolina, and Georgia. Members of this unit had expressed concern that they were exposed to chemical warfare agents during their service in Desert Storm. More than 100 veterans were evaluated. Many of them underwent extensive (7-8 hours) neurologic testing that would reveal any signs of abnormalities typically associated with neurotoxin exposure. No such evidence was identified by the

Birmingham team. Nevertheless, we have continued this program at the VA Medical Center, Birmingham.

I encourage all Persian Gulf War veterans to contact the nearest VA medical center for an appointment for a Registry examination (if they have not yet received the examination) and for any medical treatment for which they may be eligible.

About the "Review" ...

The "Persian Gulf Review" is written by VA's Environmental Agents Service (EAS). The "Review" is published to provide information about the concerns of Persian Gulf veterans, their families, and others interested in the possible long-term health consequences of military service in the Persian Gulf War. The "Review" describes actions by VA and others to respond to these concerns.

The most recent issue of the newsletter was printed warranted by significant developments. EAS anticipates publication of the "Review" about four times annually. Four issues were published in 1995 (January, April, August, and December). This issue was written in early November 1996 and does not include developments that occurred after that time.

Comments or questions about the content of the "Review" are encouraged. Suggestions and ideas for future issues of the newsletter should be sent to Donald J. Rosenblum, Persian Gulf Review, Environmental Agents Service (131), VA National Headquarters, 810 Vermont Avenue, NW, Washington, DC 20420.

Requests for additional copies of this issue should also be sent to Mr. Rosenblum. A limited supply of the February 1993, September 1993, September 1994, January 1995, April 1995, and August 1995 issues is also available. Please specify the quantity and issue dates requested. VA facilities should order additional copies from the VA Forms Depot.

Questions about the Persian Gulf Registry examination program should be directed to the Registry Coordinator or Registry Physician at the nearest VA medical facility. The telephone number can be found in the local telephone directory under the "U.S. Government" listings. Assistance is also available from the toll-free VA Persian Gulf Helpline: **1-800-749-8387**.

Disability Compensation

VA provides disability compensation to Persian Gulf War veterans with service-connected injuries and illnesses. Under certain circumstances approved by Congress, VA is authorized to compensate Persian Gulf War veterans who have an undiagnosed illness or combination of undiagnosed illnesses. I encourage all Persian Gulf War veterans with health problems that may be related to their military service to file a claim with VA for disability compensation. Applications and additional information about VA benefit programs can be obtained from a veterans benefits counselor. The national toll free telephone number for veterans benefits counselors is 1-800-827-1000.

VA is committed to finding answers to the questions raised about the health consequences of military service in the Persian Gulf War, providing medical care to veterans for medical conditions possibly related to their military service in the Persian Gulf War, and paying compensation to Persian Gulf War veterans for illnesses that were incurred in or aggravated by military service. In all instances, you should expect that you will be treated with dignity, compassion, and respect.

What Happened, When and Where

On June 21, 1996, DoD released evidence that chemical weapons containing nerve agents were present when U.S. forces destroyed an Iraqi ammunition storage bunker on March 4, 1991, and again when U.S. forces destroyed crated munitions in an open pit area outside the bunker complex on March 10, 1991. The bunker and pit area were part of a large bunker complex in an area known as "Khamisiyah" or "Tal al Lahm," located about two miles south of the town "Suq ash Shuykh" and about fifteen miles southeast of "An Nasiriyah" in southern Iraq. Khamisiyah is about 110 miles north of the Saudi Arabia border. The geographical coordinates of the bunker are 30:46:01N, 046:26:07E. The coordinates of the pit are 30:44:32N, 046:25:52E.

Khamisiyah was listed by intelligence sources as a conventional munitions storage area before the War. It was not listed as a chemical weapons site and was only a target of opportunity for coalition bombing during the air war. Four bunkers received minimal air war damage. After the February 1991 cease fire, the entire Khamisiyah ammunitions storage area was targeted for demolition. (The Khamisiyah facility consists of nearly 100 ammunition storage bunkers and 88 storage buildings. It covers a 25-square kilometer area.) According to the unit commanders involved in the demolition, there were no intelligence reports or physical findings at the time which associated Khamisiyah with chemical weapons. It was not until October 1991, that information was identified suggesting the facility stored chemical weapons during Desert Storm in a bunker, labeled bunker 73.

During the period March 3-10, 1991, U.S. forces conducted at systematic destruction of the Khamisiyah bunkers. Explosive Ordnance Disposal (EOD) unit personnel from the 60th and 146th EOD units supported the 37th Engineer Battalion, as well as elements of the 307th Engineer Battalion, during this operation. EOD members stated that they were aware that they might encounter chemical munitions at any ammunition site and were looking for them.

March 1991---Day-By-Day

On March 3, two bunkers were destroyed as a test. On March 4, the engineers destroyed 33 bunkers, including bunker 73. Although there were several chemical detectors present, there was only one chemical alarm. Some personnel went to full protective gear, others donned protective masks, and some never heard the alarm. Each company commander stated that after the alarm sounded, their units immediately conducted

more sensitive M256 kit tests and that the tests were negative for chemical agents. Subsequent reports show some inconsistencies.

Many witnesses stated that about the time the alarm went off, there were munition "fly-outs" (rockets ejected intact or damaged) which fell in their immediate area and over their location, causing them to move back several miles. A 37th Engineer Battalion after action report stated that projectiles landed as far as 10 kilometers from the site.

On March 5, a bunker (not bunker 73) which failed to detonate the previous day was destroyed. No further operations were conducted that day because of poor weather conditions. On March 6, because of concerns about the storage of demolition explosives and the potential for munition fly-outs, as were experienced on March 4, tests were conducted to implode four bunkers. This method of destruction was not satisfactory. No operations were conducted the following two days.

On March 9, the engineers conducted a reconnaissance of the remaining bunkers to be destroyed. In an interview, the 37th Engineer Battalion Operations Officer stated that he located crated munitions in a pit area, which corresponds to the location where a United Nations Special Commission (UNSCOM) investigative team later found damaged 122mm rockets containing sarin and cyclosarin.

On March 10, charges were set to demolish and destroy the remaining 60 bunkers and the pit. The troops were withdrawn southward. When virtually all personnel were moving toward their new assembly areas, the charges were detonated. The 37th Engineer Battalion noncommissioned officer who set the charges on the stack of munitions in the pit area, as well as the EOD specialist who supervised the entire demolition, stated that at that time there was not enough explosive material to completely destroy the munitions. Photographs taken two days later showed most of the rockets still intact, but not serviceable.

On March 12, there was an unconfirmed report of additional demolitions in Khamisiyah. Investigators are evaluating this report.

United Nations Unit Finds Chemical Agents

In October 1991, a UNSCOM inspection team found artillery shells and rockets containing chemical agents in Khamisiyah in two areas outside the bunker complex area. Information collected from Iraqi personnel, bunker 73, and the pit area indicated that unmarked sarin/cyclosarin filled 122mm rockets had been present in March 1991. This was the first report that chemical weapons were present at this site. Until October 1991, U.S. sources were not aware of the presence of chemical agents at Khamisiyah. This information was provided to the intelligence community in 1991, but apparently not shared with other government entities until 1996.

In March 1992, UNSCOM inspectors returned to Khamisiyah. On that visit, they reported that they consolidated and destroyed a total of 463 nerve agent 122mm rockets found

in a pit area, including the 297 they found during the October 1991 inspection. The Iraqis later found an additional 319 intact rockets buried in the pit area which were sent to al Muthanna for destruction. UNSCOM did not document that chemical munitions were found in or near bunker 73 on either the October 1991 or March 1992 inspections. None of the chemical filled 122mm rockets found by UNSCOM during either inspection possessed distinguishable external markings which might identify them as chemical munitions.

White House Orders Investigation

In March 1995, the White House directed a full-scale effort to re-examine the issue of illnesses in the Persian Gulf War veterans. As a result, the Central Intelligence Agency (CIA) initiated a comprehensive review of all intelligence related to Gulf War veterans' illnesses. In September 1995, Khainisiyah was re-identified as a site of possible chemical exposure, and DoD's Persian Gulf Investigation Team was provided this information.

In May 1996, UNSCOM inspectors returned to Khamisiyah. For the first time, they did a thorough evaluation of the remnants at bunker 73. They found that the rockets still remaining in and near the bunker possessed the physical characteristics of 122mm chemical rockets used by the Iraqis and were the same type which had been found in the pit area. During this inspection, Iraqi officials told UNSCOM that slightly more than 2,000 122mm sarin/cyclosarin rockets were moved to bunker 73 from al Muthanna just prior to the air war and that about half of the 2,000 122mm rockets were moved to the pit area before coalition forces moved to the Khamisiyah area. It was then that Iraqi officials told UNSCOM for the first time that occupying coalition forces destroyed the rockets found in the pit area.

It was not until May 1996, when UNSCOM revisited Khamisiyah that a more detailed account was available. It was not until this time that the DoD's Persian Gulf Investigation Team (PGIT) located a military member who was knowledgeable about the involvement of U.S. forces in the demolition operation. It was not until June 1996, that the PGIT identified individuals who actually were involved in the demolition process.

In June 1996, DoD announced that chemical warfare agents may have been released during Iraqi weapons demolition operations in March 1991. DoD officials indicated that there were many inconsistencies in the original reports, and it still is unclear what was found and destroyed in the pit area. They added that all medical personnel contacted so far have stated that there were no health problems reported by the troops following the demolition operation which were suspicious of exposure to chemical warfare agents. Furthermore, there were no deaths reported in the area.

In October 1996, DoD officials were working with CIA to estimate where chemical agents were released, where the demolition plumes may have traveled, and where exposures by U.S. troops may have occurred.

DoD Expands Outreach Efforts; Seeks Help from Gulf War Veterans *(Continued from pg. 1)*

Deputy Secretary White said, "Today as one key step in the Department's efforts, we are launching an outreach effort to about 20,000 Gulf War veterans who were within 31 miles (50 kilometers) of the Khamisiyah site from March 4 through March 15, 1991. We are going beyond the area in which there were likely to have been immediate effects from any chemical agent (nerve gas) exposure. Since there is evidence that chemical weapons were present during the demolition of a bunker and crated munitions in a pit area, we are asking for help from our people in learning more about what happened.

"At the same time we are asking for our Gulf War veterans to help, we want to assure them that we take care of our own," said Deputy Secretary White. "An aggressive health care outreach effort is being carried out to these 20,000 Gulf War veterans. For any of them who have health concerns, we are asking that they contact us or the VA so that we can give them a medical evaluation." The national toll-free number for DoD is 1-800-796-9699. The national toll free number for VA is 1-800-PGW-VETS (1-800-749-8386).

DoD is now investigating the possibility of a detonation at the Khamisiyah complex on March 12, 1991, two days after the final demolition previously reported. It is not known if the unit logs containing this report are accurate or, if such a demolition occurred, whether chemical munitions were involved.

DoD has launched an extensive research effort to understand what happened during the War, investigating incidents that have exposed U.S. troops to chemical weapons or other unknown substances, and assessing the health of Gulf War veterans. DoD is allocating up to \$15 million in new research into the possible effects of low-level exposure to chemical agents. Additionally, DoD is funding another \$12 million for general research on other possible causes of Gulf War veterans' illnesses.

"We are always concerned with the health of our troops - especially when they are deployed to unfamiliar environments where they may be exposed to chemical weapons," said Deputy Secretary White. "We will continue to investigate incidents that may have exposed our troops to chemical weapons or to unknown substances, and to assess and provide for the health of our Gulf War veterans."

Long-Term Health Effects of Exposure to Sarin and Cyclosarin are Uncertain

While DoD officials are trying to identify and contact individuals who may have been exposed to chemical weapons in Iraq, the long-term health consequences of such exposure remain uncertain. Investigations have not revealed information that deaths or injuries occurred among military personnel during the Persian Gulf War as a result of exposure to nerve agents. This preliminary conclusion is based on an ongoing review of health records, inspection of available medical logs of deployed units, and interviews with medical staff who were

present in the Gulf and were alert for any sign of chemical casualties. The review is continuing.

Based on available research, if symptoms are to occur following an exposure, they appear with minutes to hours. Long-term effects have not been noted in scientific publications regarding individuals who did not have symptoms at the time of exposure. Furthermore, nerve agents have not been shown to cause birth defects or cancer.

Nerve agents may be delivered in gas or liquid form. The method of delivery is dependent on the type of munition (rocket, mine, bomb), capacity of the chemical container, and weather conditions (wind, temperature, and humidity). Nerve agents are designed to interfere with the function of the nervous system, and disrupt normal control of vital organ systems required to sustain life.

Sarin and Cyclosarin

Sarin/cyclosarin, odorless, colorless, organophosphate nerve agents are the chemical warfare agents that some U.S. troops may have been exposed to in the Gulf War theater of operations. Organophosphates are a common ingredient of insecticides used in homes, industry, and agriculture, Sarin/cyclosarin are much more lethal. If contact with sarin/cyclosarin occurs, several factors determine whether harmful effects will result. These factors include the level of exposure (how much), the duration of exposure (how long), and the method of exposure (inhalation or contact with the skin).

Exposure to a small amount of vapor from sarin or cyclosarin can cause dimness of vision, runny nose, chest tightness, and tearing of the eyes within minutes of exposure. Medium amounts of vapor can cause all of these symptoms plus eye pain, headache, stomach cramps, nausea, vomiting, sweating, forgetfulness, difficulty concentrating, irritability, depression, and changes in heart rate. As with low level exposure, the symptoms occur within minutes of exposure. The effects of low and medium exposure may persist from several days up to two weeks. Exposure to high amounts may lead to loss of muscle control, twitching, paralysis, unconsciousness, convulsions, coma, and death. The most common cause of death after acute exposure is respiratory arrest. Death may occur within minutes.

Even Mild Symptoms Indicate Need for Emergency Treatment

Sudden onset of other symptoms occurring immediately or within minutes of an exposure to even small amounts of a nerve agent include impaired vision, drooling, very severe flu-like symptoms, chest discomfort and uncontrolled sweating. Anyone experiencing even these milder symptoms would be expected to seek or require emergency medical treatment,

None of these symptoms is unique for nerve agent exposures, and may be associated with other medical conditions. Existing medical knowledge has not shown low

level exposure (exposure without any symptoms at the time to be followed by chronic symptoms.

Delayed or Long-Term Effects?

A recent scientific literature of nerve agent effects conducted by the Armed Forces Epidemiology Board, an advisory committee of independent, non-government scientists, suggested that even in humans who showed signs of acute toxicity or poisoning, long-term health effects are usually absent.

In 1988, the Centers for Disease Control concluded that nerve agents present little risk of either adverse health effects from long-term exposure to low doses or of delayed health effects from acute exposures.

National Research Council panels reached similar conclusions in 1982 and 1985 reports on possible long-term exposure to chemical warfare agents. While exposure to very low doses, which cause no acute signs would also be expected to be without delayed health effects, data in this area are very limited. More research needs to be done to confirm or disprove these conclusions based on experience from episodes of poisoning. VA will sponsor research to address the questions concerning the possibility of long-term health effects as a result of very low level nerve agent exposure.

Spouses/Children Funded Exam Program Extended

The authority for the special program to fund health examinations for certain spouses and children of Persian Gulf Registry participants was recently extended from September 30, 1996, to December 31, 1998. The results of these examinations, which are conducted, under contract, by non-VA physicians in non-VA medical facilities are included in the VA Registry.

To be eligible for participation, an individual must (1) be the spouse of a veteran who is (a) listed in the VA's Persian Gulf War Veterans Registry, and (b) suffering from an illness or disorder; (2) be suffering from, or may have suffered from an illness or disorder (including a birth defect, miscarriage, or stillbirth) which cannot be disassociated from the veteran's service in the Southwest Asia theater of operations; and (3) have granted VA permission to include in the Registry relevant medical data from the evaluation. Questions about this program should be directed to the Helpline (1-800-PGW-VETS). Authority for the program was established by Public Law 103-446. It was extended by Public Law 104-262.

An alternative VA program exists for spouses and children of Persian Gulf veterans to enter their medical information into the Persian Gulf Registry. Eligible family members may have their private physicians complete a Registry code sheet containing the protocol examination information and submit it to VA for entry into the database. All expenses related to completion of the protocol and the code sheet are the responsibility of the veteran or the family

members. Anyone seeking more information about this alternative unfunded examination program for Persian Gulf veterans' spouses and children, should contact the Persian Gulf coordinator at the nearest VA medical center.

Q's and A's

The "Persian Gulf Review" occasionally includes a question-and-answer section in which VA officials respond to readers' inquiries regarding various concerns of Persian Gulf veterans and their families. Questions should be sent to Donald J. Rosenblum, Environmental Agents Service (131), VA National Headquarters, 810 Vermont Avenue, NW, Washington, DC 20420. We cannot guarantee that all questions received will be included in the "Review."

The Department of Defense provided the questions-and-answers for this issue of the "Review," focused on concerns about chemical weapons exposure during the Gulf War.

What kinds of weapons were destroyed by U.S. forces at Khamisiyah?

Khamisiyah was a large Iraqi ammunition storage site. Of the approximately 100 bunkers destroyed in March 1991, one has been assessed by UNSCOM (United Nations Special Commission) to have held 122mm rockets containing chemical agents (the nerve agents sarin and cyclosarin). In addition, rockets containing these nerve agents were found by UNSCOM inspectors in an open pit near the bunker complex, where U.S. forces also conducted demolition operations in March 1991.

What are the effects of these chemical weapons?

Chemical weapons create serious immediate symptoms (blurred vision, tightness in the chest, runny nose, dizziness) and, if immediate treatment is not provided, can incapacitate or kill troops on the battlefield. While research continues, the best current medical evidence indicates that there is no long-term health problems from low level exposure to chemical nerve agents.

What are the long-term health effects of non-lethal exposure to nerve agents?

Although they are limited in number, studies of human exposure to nerve agents suggest that no long-term health effects from low level, short-term exposure to nerve agents are likely, even when doses are large enough to produce some immediate symptoms. We are stepping up the research directed toward finding a more definitive answer to this question.

Louisville Chosen as Reproductive Health Research Center

On November 14, 1996, VA Under Secretary for Health Kenneth W. Kizer announced that the Louisville VA Medical Center has been selected to conduct research on the potential reproductive and developmental hazards of military service, "This Center brings together the resources to start answering questions about the reproductive health hazards of military service," said Dr. Kizer.

Noting the lack of substantive research on this subject, on May 24, 1996, Dr. Kizer announced a "solicitation for applicants to establish a research center for epidemiological, clinical, and basic science studies of environmental hazards and their effects in reproductive and developmental outcomes." (An article about this solicitation was included in the September 1996 issue of the "Persian Gulf Review.")

All VA facilities were invited to submit proposals. A panel of distinguished scientists from universities and governments evaluated the applications.

A joint venture with the University of Louisville's Kentucky Institute for the Environment and Sustainable Development, the Center for the Study of Environmental Hazards to Reproductive Health will be headed by Fred J. Hendler, M.D., Ph.D., Chief of Medical Oncology at the Louisville VA Medical Center and Professor of Medicine, Biochemistry and Surgery at the University of Louisville, and Dr. Jerald Hoffman, Professor of Biochemistry at the University of Louisville.

The Center's overall goal is to determine whether exposures to hazardous substances affects reproductive capacity and causes developmental abnormalities in the children of veterans. While studies to date of Persian Gulf War veterans and their families have not shown an increased rate of birth defects, pediatric illnesses, or unusual contagious disease patterns, many Gulf War veterans have expressed concerns about this matter. VA agrees that more research is needed, and further studies are in progress.

The Louisville Center for the Study of Environmental Hazards to Reproductive Health is the fourth VA environmental hazards research center. The other three centers were established in 1994 at VA medical centers in Boston, MA, Portland, OR, and East Orange, NJ. (An article about these three centers was included in January 1995 issue of the "Persian Gulf Review.")

VA Study Shows Higher Accidental Death Rate For Persian Gulf War Veterans

A major VA study, published in the November 14, 1996 issue of the New England Journal of Medicine, revealed a higher accidental death rate among Persian Gulf War veterans compared to Gulf War-era veterans who served outside the theater of operations.

The study "Mortality Among U.S. Veterans of the Persian Gulf War" sought to identify non-battle post-war deaths as of September 1993 among the 695,516 individuals deployed in the Gulf from the mobilization in late 1990 through the cease-fire in 1991. The analysis showed the excess deaths were principally due to vehicle accidents and, to a lesser extent, other kinds of accidents and external causes of death, but not disease. The same association was slightly more pronounced in women.

"The data on deaths due to external causes and the gender differences may suggest a need for further study. But on the whole, this new research offers at least preliminary reassurance

to veterans concerned about disease-related causes of death. Illness-based mortality rates are not elevated among the Gulf theater veterans." said VA Secretary Jesse Brown. "But because diseases such as cancer take time to develop," Secretary Brown observed. "we are committed to continuing additional phases of this study in the years ahead." Preliminary work on an update study through 1995 is in progress.

In the published study, the 1,654 deaths identified in the Gulf theater group for which death certificates were located were compared with 1,615 deaths analyzed in the control group of 746,291 veterans of the same era who did not serve in the Gulf. The death certificates were located for more than 93 percent of the deceased veterans in both groups. Causes of death were grouped and a ratio was developed comparing the mortality rates for each cause between the theater-deployed veterans and the group of controls.

"The excess deaths in the Persian Gulf theater group appeared entirely attributable to external causes, including all types of accidents and motor vehicle accidents specifically," said investigator Han K. Kang, Dr.P.H., Director, VA Environmental Epidemiology Service. "There was no observed excess of suicides, homicides, or deaths from disease-related causes, and the rate of death from infections and parasitic diseases was slightly lower among Gulf War veterans than other veterans." he added.

The authors, Dr. Kang and Tim A. Bulhnan (also of the Environmental Epidemiology Service), had no explanation for the excess deaths due to vehicle accidents or other external trauma, but speculated that there might be a tendency for survivors of war to perceive risk differently and engage in more risk-taking behavior, or they may be at risk of post-traumatic stress disorder or other depressive disorders that contribute to the phenomenon.

Similarly, the analysis did not provide an explanation for the observation that postwar mortality appears to be greater among female veterans. In women Persian Gulf War veterans, there was a statistically significant excess of deaths from all external causes, including accidental deaths. In addition, mortality due to vehicle accidents, suicides, and homicides was elevated, but none of those individual factors alone provided a statistically significant association,

Mobilization without actual deployment was also evaluated. While there was no substantial consequence on mortality of all those veterans as a group, among women who were mobilized but not deployed, there was a higher (but not statistically significant) rate of death in each category compared to control group veterans who were not mobilized at all.

One limitation of the study underscoring the need for more research on Persian Gulf War veterans' health was the potential confounding variable of the "healthy worker effect." Since seriously ill service members or those recovering from surgery, for example, would not likely have been deployed to a combat theater, service members who were healthier at the outset of the study period may have been over-represented in the deployed group.

Without studying medical records, study findings also are limited by use of death certificates in the determination of cause of death.

Where to Get Help

Active duty military personnel with questions or concerns about their service in the Persian Gulf region - contact your commanding officer or call the Department of Defense (DOD) Persian (Gulf Veterans' Hotline (1-800-796-9699) for an examination.

Persian Gulf veterans with concerns about their health--contact the nearest VA medical center. The telephone number can be found in the local telephone directory under Department of Veterans Affairs in the "U.S. Government" listings. A Persian Gulf Registry examination will be offered. Treatment will be provided to eligible veterans. The VA Persian Gulf Information Helpline can also provide the latest information and assistance. The toll-free telephone number is **1-800-PGW-V ETS (1-800-749-8387)**.

Persian Gulf veterans in need of marital/family counseling--contact the nearest VA medical center or VA vet center. For additional information, call the Persian Gulf Information Helpline at **1-800-PGW-V ETS (1-800-749-8387)**

Persian Gulf veterans seeking disability compensation for illnesses incurred in or aggravated by military service--contact a Veterans Benefits Counselor at the nearest VA regional office or health care facility or call the VA Persian Gulf Information Helpline at **1-800-PGW-V ETS (1-800-749-8387)**.

Persian Gulf veterans interested in learning about the wide range of benefit programs administered by VA.

Anyone with first-hand information about "incidents" that occurred in the Southwest Asia theater of operations during the Persian Gulf War that may be related to health problems experienced by military personnel who served in the War - call the DoD "Incidents" Hotline at **1-800--472-6719**.

For additional information about VA's program initiatives, see VA's Persian Gulf War veterans' illnesses home page at

<http://www.vagov/health.envIRON/pergulf.html>

Note: Representatives of veterans service organizations, including the American Legion, Veterans of Foreign Wars of the United States, Disabled American Veterans, etc., may also be very helpful to Persian Gulf veterans. Persian Gulf veterans with concerns about their health--contact the nearest VA medical center. The telephone number can be found in the local telephone directory under Department of Veterans Affairs in the "U.S. Government" listings. The VA Persian Gulf Information Helpline can also provide the latest information and assistance. The toll-free telephone number is **1-800-PGW-V ETS (1-800-749-8387)**.

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Who Served in Desert Shield/Storm*
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**Department of
Veterans Affairs**

Environmental Agents Service (131)
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